

Full Service Optical Workstation



D-node

JH-DN31032C

DOCSIS3.0



About D3-C Series

The D3-C series is the third edition of Jinghong's DOCSIS3.0 CMTS product platform. There are various product forms such as indoor type, D-node (outdoor type), and modular type to meet various deployment scenarios.

Compared with earlier versions, the D3-C series uses the latest MAC/PHY chips and a more powerful multi-core network processor from Broadcom. On the basis of maintaining the original features, its bandwidth has doubled, packet throughput reached 3Mpps. It can support 1000 CMs simultaneously online.

Bundled with 32 QAM channels for downstream (sharing one RF port), the data rate could be up to 2Gbps. The downstream can be configured flexibly as data channels or IPQAM channels. It also supports multicast capabilities.

Bundled with 10 QPSK/QAM channels for upstream (sharing one RF port), the data rate up to 400Mbps. It also provides the upstream spectrum analysis function.

D3-C can run in L3 or L2 mode. It has perfect QoS mechanism, built-in DHCP/TFTP/ToD servers, supports DHCP relay, and supports IPv6. It can adapt to varieties of operation environment to meet various business requirements.

There are three ways to manage the D3-C series: one is to log in through Telnet on the local machine, use the command line (CLI) for configuration management; the second is based on the embedded Web mode, which can be remotely logged into the device; the third is through network management software based on SNMP protocol and supports network management software from third parties.

D3-C series can be compatible with cable modem which conforms to DOCSIS 3.0/2.0 standard, as well as the built-in cable modem set-top box, eMTA and other terminal equipment.

Summary

JH-DN31032C, is a D-node device (commonly known as all-in-one). Adopting the design concept of modularization, zero configuration, intelligent management, and simple maintenance. It is deployed in the fiber node, making the fiber node become the transmission path of the integrated service, thus greatly simplifying the network structure.

D-node has built-in CMTS module, CATV optical receiving and amplifying module, ONU module (optional), etc.. These modules can be replaced separately. Jinghong also creatively increased the spectrum analysis module, so that RF signals can be fully spectrum real-time monitoring. The NMS can automatically monitor the working status of each module, automatically analyze and locate the faulty module, and alarm or notify maintenance personnel to replace it at the site.

The basic service of cable operator has stable and reliable guarantees. JH-DN31032C has four high-level output ports with a frequency range exceeding 1 GHz, which can completely replace the original optical receiver. It can flexibly adapt to 10GE/GE/GPON/EPON networks through matching modules such as SFP+/SFP/OTU/ONU. The built-in CMTS module is bundled with 32*10 channels, and the 2Gbps data rate is sufficient for the user's big bandwidth requirements.

JH-DN31032C is compact and waterproof to accommodate various installation environments. Its excellent transmission capability, combined with intelligent management software, can meet the NGB requirements of cable operators.

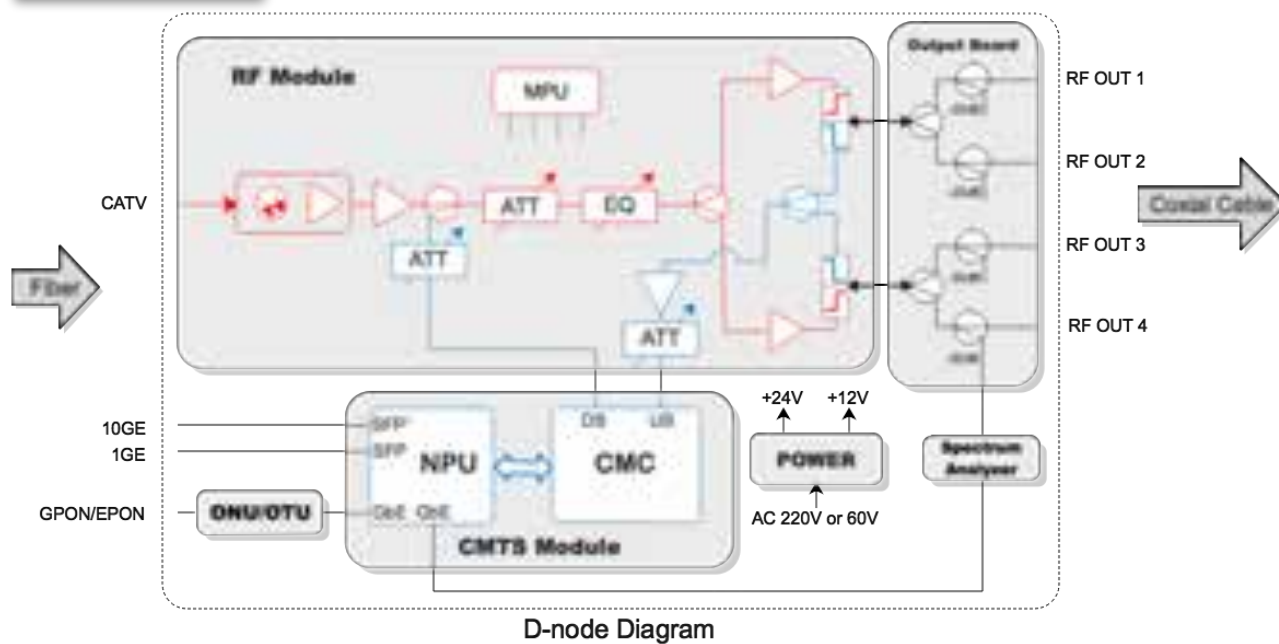
Function

- CATV optical receive and amplify
- IP data from GE/EPON/GPON is forwarded in coaxial cable
- Real time monitor the full spectrum RF signal quality of fiber node
- Support service: DVB, IP data, IPQAM, IPTV, etc.

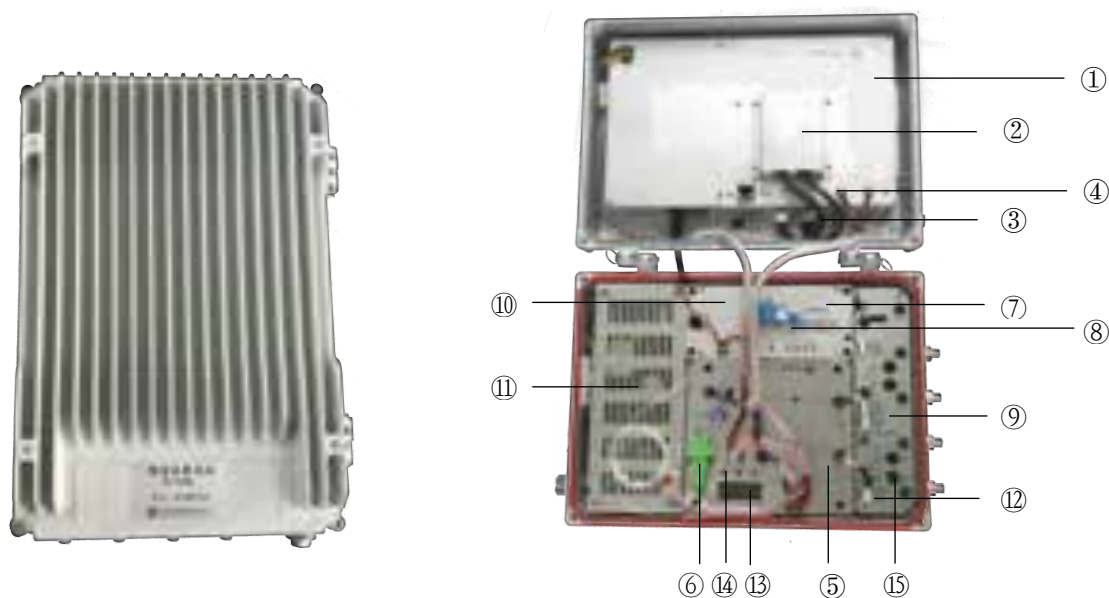
Feature

- Based on the mature DOCSIS3.0/C-DOCSIS standard, Support the evolution to DCAP and CCAP structures. There is no investment risk.
- Modular design, zero configuration application, intelligent management, simple maintenance.
- It overcomes the defect that the traditional CMTS can only be deployed in the headend, and greatly reduces the "funnel noise" interference.
- Saving frequency sources
- Remote monitor, Remote maintenance, Remote update
- The transmission distance is almost unlimited
- Low Coverage Cost, Low unit bandwidth cost
- It is an integrated compact device that can completely replace the original optical node equipment.

Block Diagram



Appearance



- ① CMTS Module
- ② SFP/SFP+ Module
- ③ 1000M Base-T Port
- ④ DS/US Port
- ⑤ RF Module

- ⑥ CATV Fiber Port
- ⑦ ONU/OTU Module
- ⑧ GPON/EPON Fiber Port
- ⑨ RF Output Port Board
- ⑩ RF Signal Annalyer Module

- ⑪ Power Supply Module
- ⑫ AC60V Internal Supply Switch
- ⑬ LED Display
- ⑭ Set Button
- ⑮ RF Test Port (-30dB)

Advantages of D-node

Adopting standardized mature technology without investment risk

Because full service optical station (D-node) is based on mature and reliable standardization technology, it can make full use of existing transmission network and terminal equipment. Whether IP backbone is Ethernet or EPON/GPON, it can be compatible. Cable operators will no longer have to worry about choosing which EOC technology to protect existing resources and avoid investment risks.

Simplified network structure with better profit

■ More Stable

Because the size of the covered users is small, the "funnel" becomes smaller, the total amount of noise naturally decreases, and the built-in CMTS module can operate stably in a "clean" network environment. In addition, due to the decrease of cable connector, it also helps to improve reliability.

■ The Average Bandwidth of Each User is Higher

When the total bandwidth is constant, the less users are covered, the more bandwidth each user will get.

■ Construction and maintenance is simpler and more convenient

■ The inherent contradiction between coverage efficiency and funnel noise is solved

For traditional DOCSIS schemes, because the equipment is expensive, CMTS is usually deployed in the front-end room for wide coverage. The larger the coverage of each CMTS, the higher the coverage efficiency and the lower the cost, but the larger the "funnel" the greater the noise. This seems to be a natural contradiction. Now, the adoption of D-node can solve this contradiction.

Low coverage cost and lower cost unit bandwidth

■ Compared with EOC, D-node has obvious bandwidth advantages, stronger adaptability and higher coverage efficiency.

■ Compared with FTTH, D-node can save a lot of engineering cost, reduce construction investment and investment risk.

■ The bandwidth advantage of D-node can fully meet the needs of operators for large bandwidth business..

Advanced management ability

By means of embedded WEB, NMS and Telnet CLI, D-node can be centrally managed or managed separately. The management includes the device itself, RF signal full spectrum analysis, signal quality analysis and terminal user management, as well as fault analysis, positioning, alarm management, etc.

■ Manage the Device

Monitor and control the operating status, working voltage, level, temperature, reset and other parameters of the equipment, remotely configure and modify the operating mode and operating parameters of the equipment, and also have a fault alarm function.

■ Manage the end user

It includes user basic information, permission control, speed limit setting, billing management, etc. It can also monitor the running status and parameters of the CMs.

■ Analyze the RF spectrum and signal quality

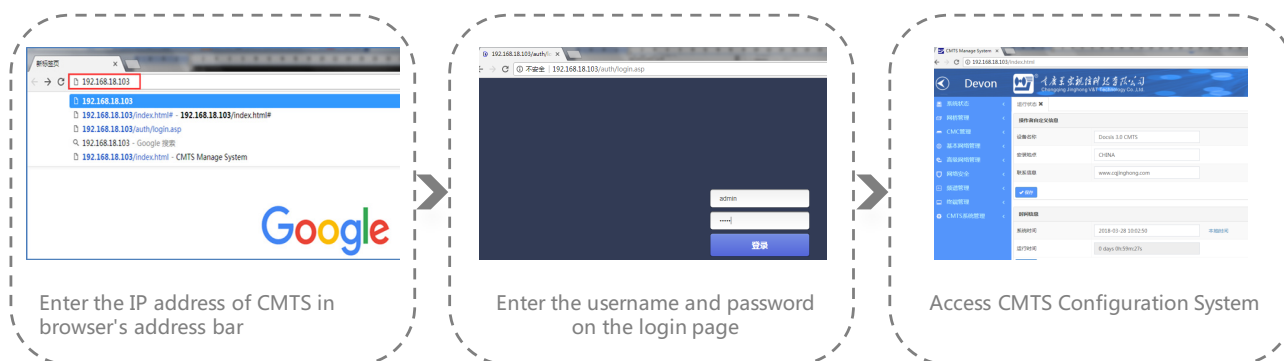
D-node built-in signal analysis module, equivalent to a vector signal analyzer. It can analyze the signal spectrum of each RF port from 5 MHz to 1000MHz, and can analyze the quality parameters of the DS signal, such as level, C/N, MER, constellation diagram, etc. It can monitor the noise interference status of the return path at any time and make early warning.

■ Fault Location

Due to the modular design, the management system can intelligently analyze the fault range and judge the fault attributes when the equipment fails. If it belongs to the hardware fault, it can locate the malfunction module automatically and prompt the maintenance personnel to replace it.

Configuration & Management

Embedded Web



System Status

Run state
Power
Environment

Uplink Port Management

IP parameter
Uplink port

CMC Management

CMC 1
...
CMC 20

Basic Network Management

Static route
Built-in DHCP scope
CPE Class set
ARP list

Advance Network Management

IP-Bundle set
VLAN set
VLAN-Bundle set
Multicast management



Security Management

Parameter set
Fire wall
ACL rules

Spectrum Management

Spectrum rules
Frequency hopping Log

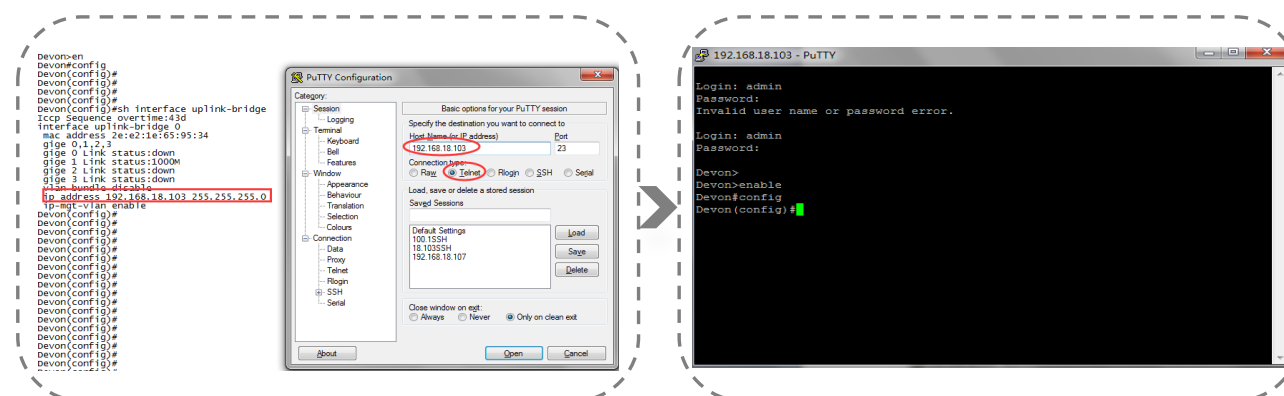
Terminal Management

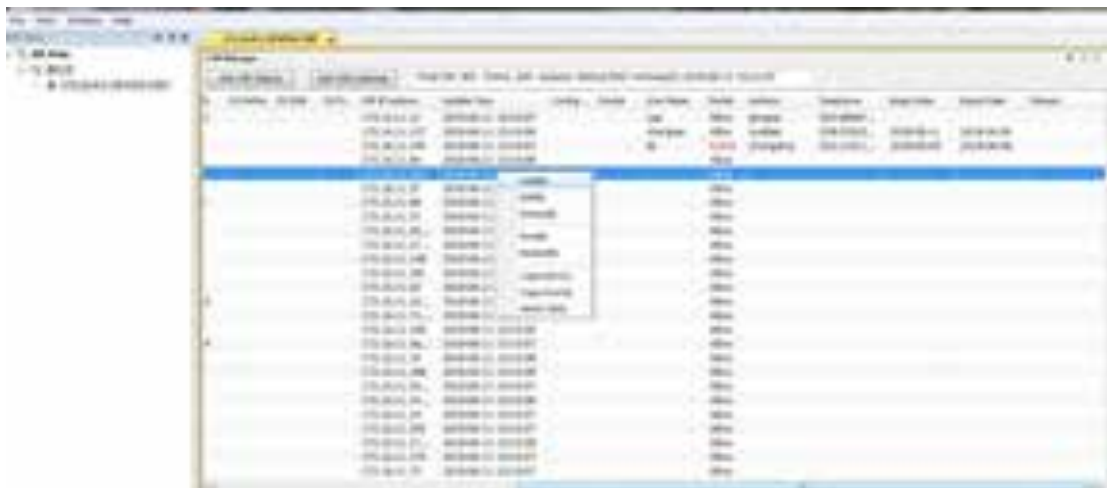
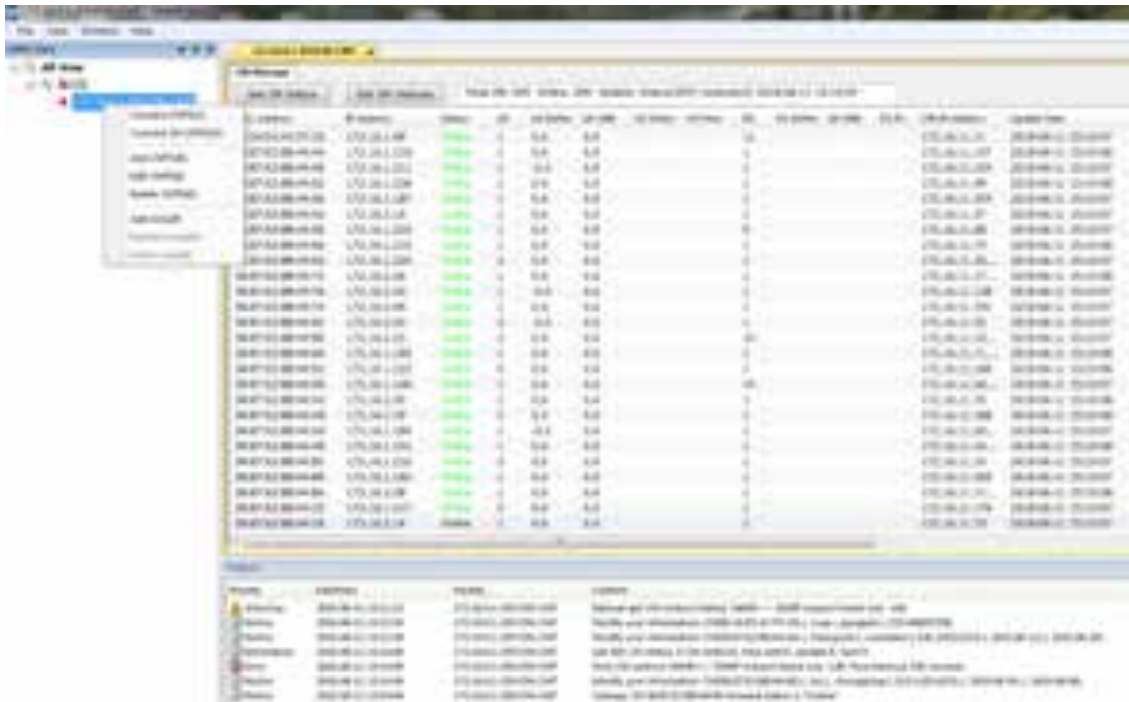
CM list
CPE list
CM authority
CM speed limit
Cable Modem Flap

CMTS System Management

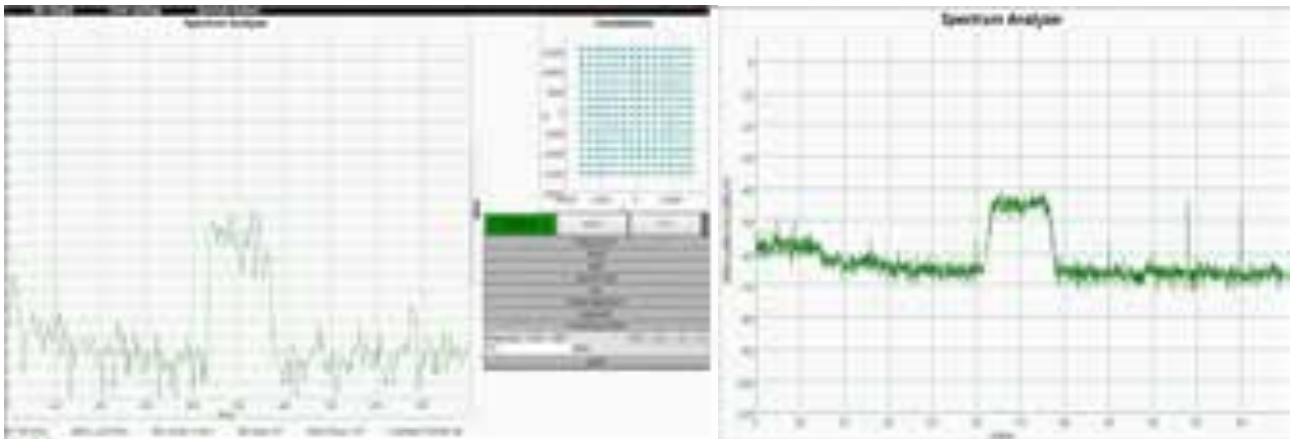
Remote Query
Device management
User management
Key management
Configuration management
Update
Log management

CLI





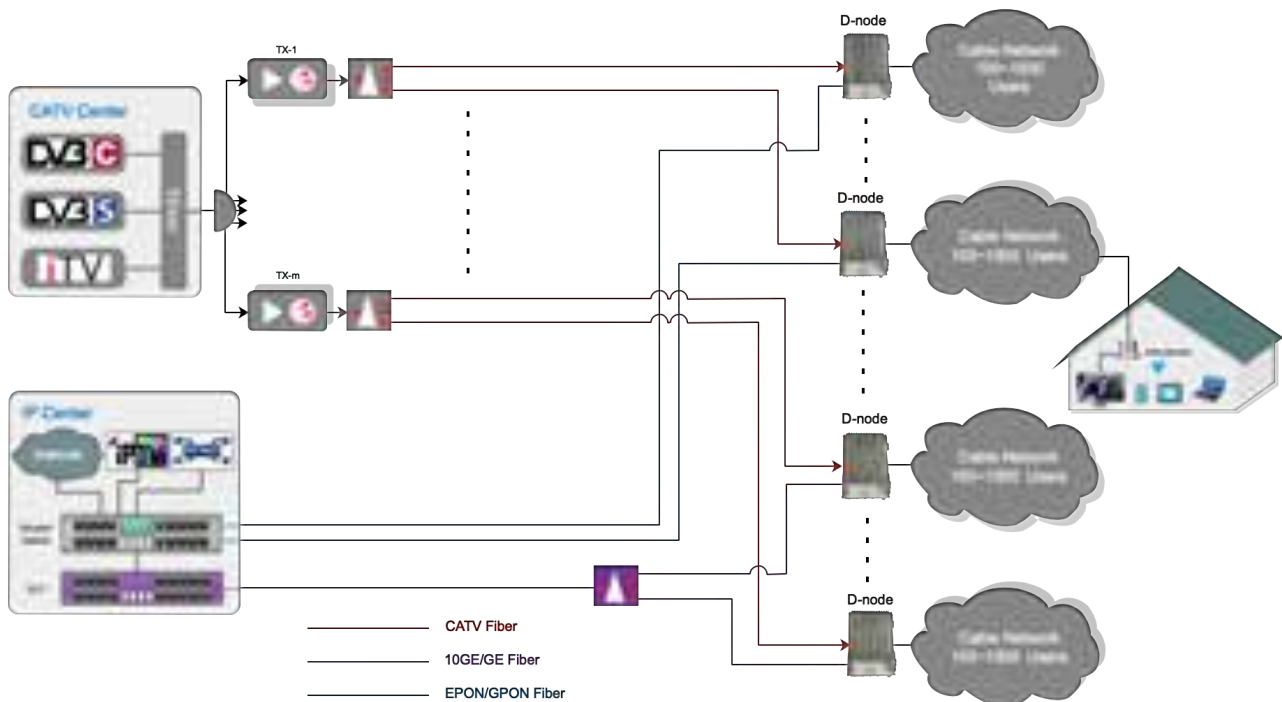
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Application

Deploy at Fiber node

For those nodes with 100-1000 users, it is quite rapid to cover such users by deploying D-node which is compatible with various kinds of uplink IP network like EPON/GPON/GE/10GE.



Specification

CMTS Module									
		Down Stream		Up Stream					
		Euro-DOCSIS3.0	DOCSIS3.0						
Modulation Mode		64QAM/256QAM/1024QAM		256QAM/128QAM//64QAM/32QAM/16QAM/8QAM/QPSK					
Frequency Range (MHz)		108~1002/1218		5~85/65					
Single Channel BW (MHz)		8	6	Single Channel BW (MHz)		6.4	3.2	1.6	
Number of Bounding Channels		32		10					
Maxim Total Data Rate (Mbps)		2000	1600	400					
Single Channel Data Rate (Mbps)	64QAM	41	27	Single Channel Data Rate (Mbps)	256QAM*	40.96	20.48	10.24	
					128QAM*	35.84	17.92	8.96	
	256QAM	55	38		64QAM	30.72	15.36	7.68	
					32QAM	25.60	12.80	6.40	
	1024QAM*	69	53		16QAM	20.48	10.24	5.12	
					8QAM	15.36	7.68	3.84	
					QPSK	10.24	5.12	2.56	
Output Level (dBmV)		20~45 Adjustable, 1dB Step		Receive Level (dBmV)		-13~+23			
Single Channel Symbol Rate (Msym/s)	64QAM	6.952	5.056941	Single Channel Symbol Rate (Msym/s)		5.12	2.56	1.28	
	256QAM	6.952	5.360537						
	1024QAM*	6.952	5.360537						
Number of RF Port		1		1					
Reflection Loss (dB)		> 12		> 14					
Output Impedance (Ω)		75		Input Impedance (Ω)		75			
Management Method		1) Telnet Login, CLI Operate; 2) Network Management Software Based on SNMP; 3) Embedded Web, remote login							
WAN Port	Optical	1.25G SFP; 10G SFP+		Power Supply		DC 12V			
	Electronic	1000M Base-T ×2		Running Current		3.5A			
RF Port		SMB socket ×2		Console Port		RJ45 socket ×1			
Status Display		LED		Size (L×W×H)		280×165×26 (mm)			
CATV Module									
Receiving Wavelength (nm)		1200~1610		Receiving Level (dBm)		-10~+2			
Optical AGC Range (dBm)		-7~+3		Optical Connector Form		SC/APC or FC/APC			
DS Frequency Range (MHz)		88~1002		US Frequency Range(MHz)		5~85/65			
Output Level (dBmV)		45		Reflection Loss (dBc)		>12			
Flatness (dB)		±1.5		Output Impedance (Ω)		75			
C/N (dBc)		>51		CTB (dBc)		>66			
Attenuation Range (dB)		0~20		CSO (dBc)		>61			
EQ Range (dB)		0~15		RF Port		5/8'F-type Socket			

ONU Module (Optional)				
Support Protocols	IEEE 802.3ah; YD/T 1475-2006; IEEE 802.1D Spanning Tree; IEEE 802.1Q; VLAN; IEEE 802.1w; RSTP/Ethernet-II Ethernet-SNAP; IEEE 802.3x; Prevent Head Of Line mechanism; IEEE p802.1p; CoS; WR/SP and FIFO Queue scheduling algorithm; UDLD; Dying-Gasp; CHAP; EAP; CLI; Web; SNMP; TELNET; TFTP; FTP	Tx Optical Wavelength (nm)		1310
		Rx Optical Wavelenth (nm)		1490
		Tx Optical Power (dBm)		-1~+4
		Rx Optical Power (dBm)		-26.5~-3
		Optical Connector Form		SC/PC
		Ethernet Port		10/1000M Base-T ×4
		Data Rate		1.0Gbps
RF Analyzer Module				
	Frequency Range (MHz)			
	88~1002	5~85/65		
Operating Mode	Spectrum and signal quality analyze	Spectrum analyze	CMC-CM Operation state diagnosis	
Receiving Level	85±5dBmV	-20~+20dBmV		
RBW	3KHz, 10KHz, 100KHz, 1MHz			
SBW	3MHz, 6MHz,			
Main Functions	Channel Power, MER, C/N, Constellation	Noise Analyze		
Miscellaneous				
Power Supply	External	AC165~230V/50Hz	Waterproof Grade	IP65
	Internal	AC 45~75V		
Total power consumption		<85W	Net Weight	8.1Kg
Working Environment		Temp.: -40~+55℃; HUM<90%	Dimensions (L×W×H)	380×260×140(mm)

* CM is also needed to synchronize support
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